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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT NO. [REDACTED]

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COUNTRY Korea/USSR

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SUBJECT Examination of Soviet Micrometer Gages

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1. The instruments examined are described as follows:

a. Example No. 1 is a clamp-lock, external-measuring, micrometer caliper with a measuring range from 25 to 50 mm. This instrument

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b. Example No. 2 is a screw-lock, external-measuring, micrometer caliper with a measuring range from 25 to 50 mm. With the exception of the different lock and the absence of a serial number marking, this instrument is quite similar to Example No. 1.

c. Example No. 3 is a micrometer, indicating snap gage with a dial reading range of plus and minus 0.08 mm. and provision for tool-room setting over the range from 25 to 50 mm. This instrument bears

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2. The three instruments were examined for finish and hardness in comparison with U. S. Federal Specification GGG-C-106 for Calipers and Depth-Gages, Micrometer.

a. Pits were found on the faces of all three micrometers. Available from the CIA library are 8 power photo micrographs showing the pits on the dies of Examples No. 2 and 3.

b. The Rockwell "C" hardness of the moveable dies was measured and determined to be as follows:

Identification	Rockwell "C" Hardness	
	As Measured	Corrected for Curvature
Example No. 1	58	60
Example No. 2	64	65
Example No. 3	64	65
U. S. Federal Specification	-	62

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CLASSIFICATION

STATE	<input checked="" type="checkbox"/>	NAVY	<input checked="" type="checkbox"/>	NSRB															
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- c. The error in flatness of the dies was determined to be as reported immediately below. [Available from the CIA Library are photographs made with a micro interferometer indicating the surface finish on the instrument dies.]

<u>Identification</u>	<u>Error in Flatness of Instrument Dies</u>
Example No. 1	0.0005 mm
Example No. 2	0.0014
Example No. 3	0.0005

3. The instruments were examined for accuracy according to procedures suggested by U. S. Federal Specification GGG-C-106 with the following results:

<u>Error in Reading</u>		
<u>Scale Interval</u>	<u>Example No. 1</u>	<u>Example No. 2</u>
0-2.5 mm	±0.002 mm	±0.001 mm
0-5.1	.000	±.002
0-7.7	±.002	±.003
0-10.3	±.001	±.003
0-12.9	.000	±.003
0-15.0	±.002	±.002
0-17.6	±.001	±.001
0-20.2	±.001	±.001
0-22.8	±.001	.000
0-25.0	±.001	.000

<u>Error in Reading</u>	
<u>Indicator Setting</u>	<u>Example No. 3</u>
-0.08 mm	±0.0005 mm
.07	- .0005
.06	- .0005
.05	- .0005
.04	±.0005
.03	±.0005
.02	±.0005
.01	.0000
.00	.0000
±.01	- .0010
.02	- .0005
.03	- .0010
.04	±.0005
.05	- .0010
.06	- .0010
.07	- .0010
.08	- .0010

4. A dimensional examination in accordance with procedures suggested by U. S. Federal Specification GGG-C-106 has yielded the following data:

<u>Dimension</u>	<u>Example No. 1</u>	<u>Example No. 2</u>	<u>Example No. 3</u>
Maximum error parallelism of dies	0.0010 mm	0.0013 mm	0.0010 mm
Width of graduations (thimble)	0.163-0.213	0.178-0.213	-
Width of graduations (barrel)	0.137-0.216	0.183-0.241	-
Radial clearance between barrel and thimble at reading edge	0.23	0.29	-
Error in uniformity of diameter of dies	0.002	0.008	-
Error in alignment of dies	0.13	0.11	-
Length of 25 mm standard supplied with instrument	25.001	-	-

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5. Conclusions drawn from these analyses are as follows:

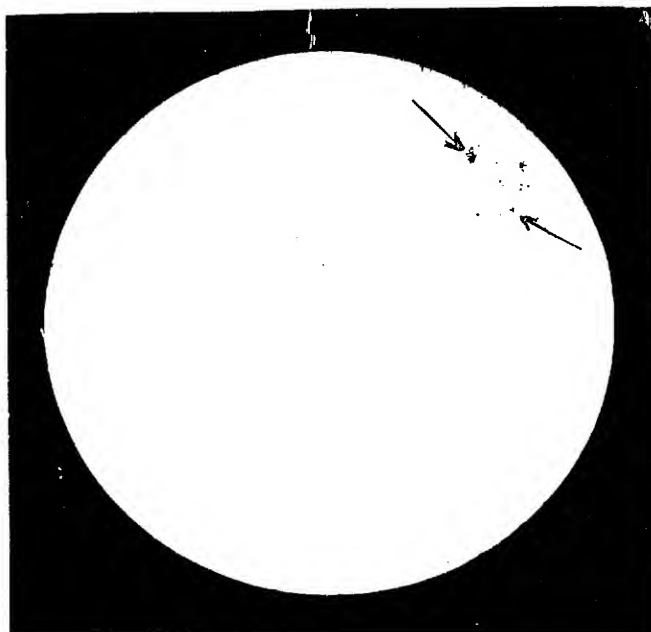
- a. The micrometers examined compare favorably with the best grade of micrometers made in the U.S.A.
- b. The only dimensions of Examples 1 and 2 which do not comply with Federal Specification GGG-C-106 are the width of graduations and alignment of dies.
 - (1) The specification for width of graduation is from 0.15 to 0.20 mm.
 - (a) One line out of five on the thimble and one out of six on the barrel of Example 1 exceeds the specification maximum width.
 - (b) One line out of five on the thimble and four lines out of six on the barrel of Example 2 exceed the specification maximum width.
 - (2) The specification for maximum permitted error in alignment of dies is 0.08 mm.
 - (a) Alignment error of Example 1 is 0.13 mm.
 - (b) Alignment error of Example 2 is 0.11 mm.
- c. The surface finish on all instrument dies is within the range found on micrometers of U.S.A. manufacture.
- d. The micrometer screws on these instruments are somewhat freer in their nuts than is recommended by U.S.A. practice. Consequently, the instruments do not repeat their readings under light contact pressure as well as do comparable instruments of U.S.A. manufacture.
- e. While Example 3 exhibits errors in reading within 0.002 mm as required by the certificate which accompanies the instrument, the maximum error is -0.0010 mm, which is opposite in direction from the certified maximum error of 0.002 mm.

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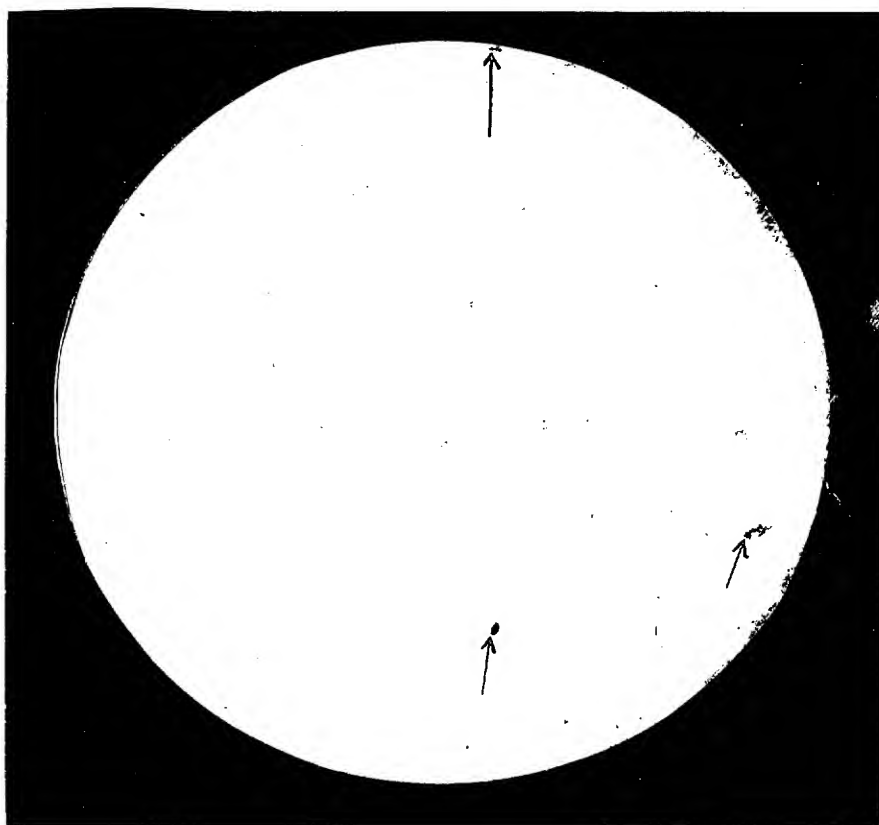
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Caliper with screw lock



Caliper with measuring dial

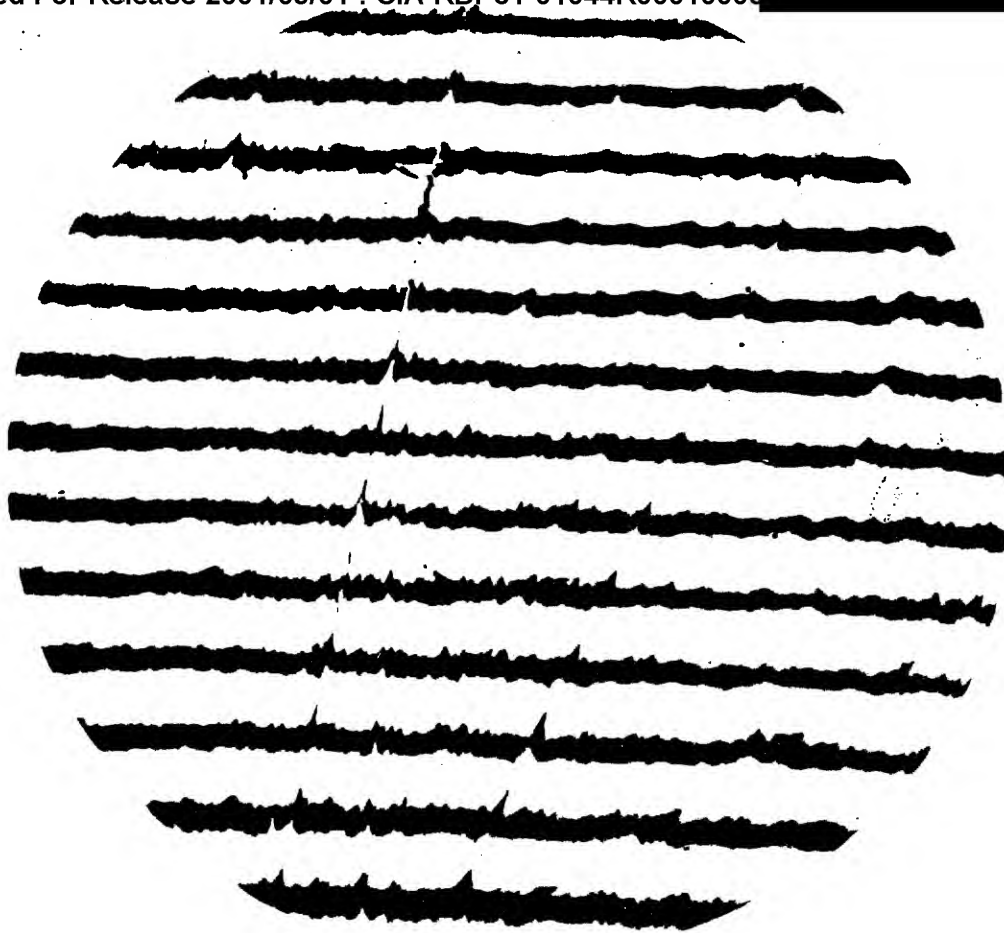
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Fig. 1. Pits in measuring faces of moveable dies of two of the three micrometers submitted. Arrows indicate the locations of pits.

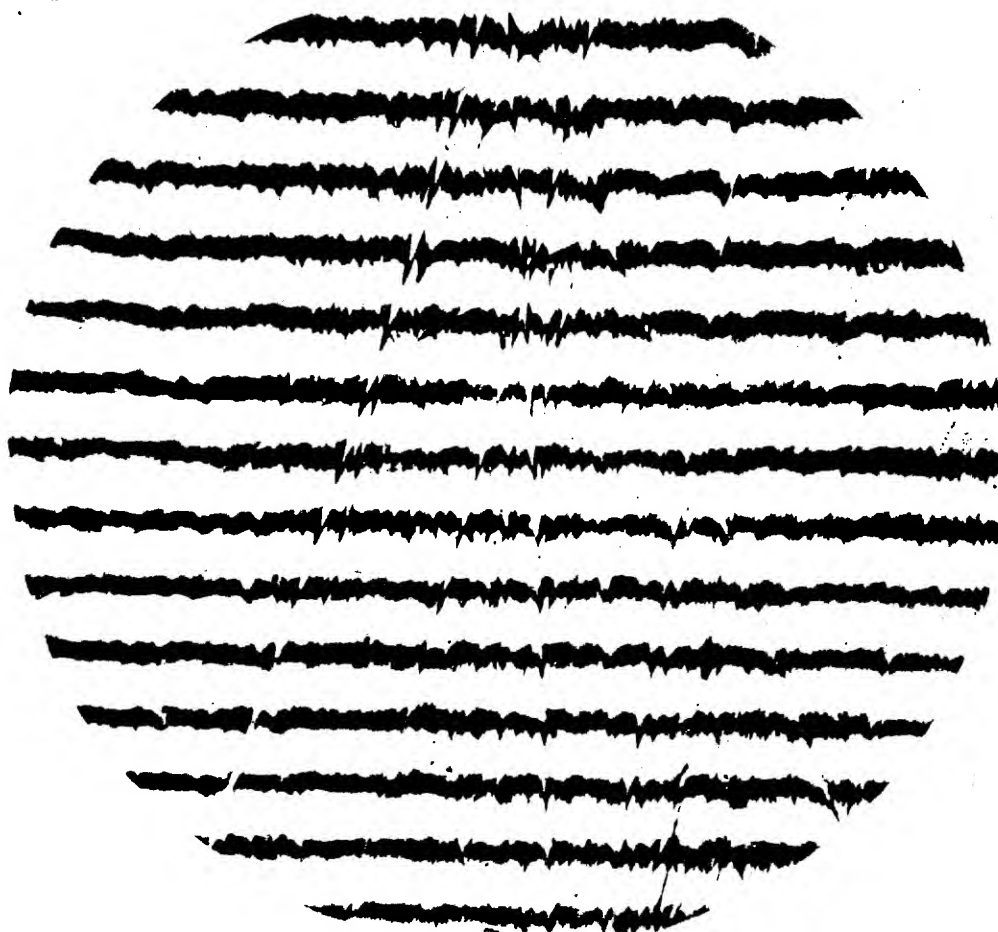
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Contact surface of micrometer with screw lock 185



Contact surface of indicating snap gage



Contact surface of micrometer [REDACTED]

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